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TO: OEHS/DWSE Staff

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FROM: D/DBP Team

SUBJECT: Water – Procedures – IESWTR – Filtration

The Interim Enhanced Surface Water Treatment Rule (IESWTR) applies to all public waterworks, serving 10,000 or more persons, using conventional filtration or direct filtration to treat surface water or groundwater under the direct influence of surface water. The turbidity requirements of the IESWTR will become effective January 1, 2002. The M/DBP Team continues working to incorporate the IESWTR into the *Waterworks Regulations*, but until this is done, waterworks must meet the requirements found in the Federal Rule.

The turbidity requirements are as follows:

1. Treatment Technique Requirement:

   For waterworks using conventional filtration or direct filtration, the turbidity level of representative samples of filtered water must be less than or equal to 0.3 NTU in at least 95 percent of measurements taken each month. In addition, at no time shall the turbidity level of representative samples of filtered water exceed 1 NTU. Failure to meet either of these limits is a treatment technique violation.

   The representative sample of the filtered water has also been referred to as a sample of the combined filter effluent. According to the guidance manual for the Surface Water Treatment Plant Rule, the following four locations will satisfy the requirement that the turbidity samples be representative of the filtered water:

   - Combined filter effluent prior to entry into a clearwell,
   - Clearwell effluent,
   - Plant effluent or immediately prior to entry into the distribution system, or
   - Average of measurements from each filter effluent.

   According to an E-mail dated July 16th from Jason Gambatese, EPA Region III, the "combined filter effluent should be monitored as close as physically possible to the point where the water leaves the filters. In essence, that would mean all four locations listed above would be acceptable, but in a ranked manner based on the idea that you want to monitor as close as physically possible to the combined filter effluent point."

   The IESWTR refers to the existing requirements for turbidity monitoring. That is, the turbidity samples are to be collected every four hours (or more frequently) the waterworks serves water to the public. The waterworks may substitute continuous

turbidity monitoring for grab sample monitoring if it validates the continuous measurements for accuracy on a regular basis using a protocol approved by VDH. Please refer to §12 VAC 5-590-370 B 7 a of the *Waterworks Regulations*.

The IESWTR also requires that the waterworks report to VDH the following turbidity measurements within 10 days after the end of each month that water is served to the public:

- The total number of representative samples of the filtered water taken during the month.
- The number and percentage of representative samples of the filtered water taken during the month which are less than or equal to 0.3 NTU.
- The number and percentage of representative samples of the filtered water taken during the month which are less than or equal to 1 NTU.
- The date and value of any representative samples of the filtered water taken during the month which exceed 1 NTU.

A further requirement of the IESWTR is any time the turbidity exceeds 1 NTU in representative samples of filtered water, the waterworks must inform VDH as soon as possible, but no later than the end of the next business day of the exceedance.

Failure to report either of the above items is a monitoring violation.

2. Filter Monitoring Requirement:

The IESWTR requires continuous turbidity monitoring of each individual filter. The waterworks must calibrate the turbidimeters using the procedure specified by the manufacturer. Turbidity readings for each filter must be recorded every 15 minutes with results being maintained for three years. If continuous turbidity monitoring equipment fails, grab sampling must be conducted every four hours in lieu of continuous monitoring, for no longer than five working days following the failure of the equipment. This means that the continuous monitoring equipment must be repaired within 5 working days. If the collection of the grab samples continues beyond the five working days it is a monitoring violation.

The waterworks must report to VDH that they have conducted individual filter turbidity monitoring within 10 days after the end of each month the waterworks serves water to the public. Failure to report is a monitoring violation.

The individual filter turbidity measurements must not exceed any of the limits listed in the following paragraphs. If these limits are exceeded then the waterworks must report to VDH the individual filter turbidity measurement results, the filter number, turbidity measurement(s) and date(s) on which the exceedance occurred and any follow-up action within 10 days after the end of each month the waterworks serves water to the public.

- Turbidity level greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart. The waterworks must produce a filter profile within seven days of the exceedance or identify the obvious reason for the exceedance and report that the profile has been produced or report the reason for the exceedance.
- Turbidity level greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation, after the filter has been backwashed or otherwise taken offline. The waterworks must

produce a filter profile within 7 days of the exceedance or identify the obvious reason for the exceedance and report that the profile has been produced or report the reason for the exceedance.

- Turbidity level greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of three consecutive months. The waterworks must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. The self-assessment must consist of the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.
- Turbidity level greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months. The waterworks must arrange for the conduct of a comprehensive performance evaluation by the State or a third party approved by the State no later than 30 days following the exceedance and have the evaluation completed and submitted to the State no later than 90 days following the exceedance.

Failure to report any of the exceedances and the follow-up action is a monitoring violation.

Further information on the requirements of the turbidity provisions of the IESWTR can be found in the “Guidance Manual for Compliance with the Interim Enhanced Surface Water Treatment Rule: Turbidity Provisions” produced by the USEPA and dated April 1999. A copy of this manual is available in each Field Office and an Adobe Acrobat file copy is also available on the server in each Field Office.

Attached is a sample Filter Performance Monthly Operation Report, to be completed by the Waterworks and submitted no later than 10 days after the end of the month being reported. This may be incorporated into the monthly report form for the waterworks.

COMBINED FILTER MONITORING
FILTER PERFORMANCE MONTHLY OPERATION REPORT

Waterworks: _____ MONTH: _____

PWSID No.: _____ YEAR: _____

COUNTY: _____

Total number of measurements: _____

Number ≤ 0.3 NTU _____ _____%

Number ≤ 1 NTU _____ _____%

Number > 1 NTU _____(if none, enter "none")

Record the date & turbidity value for any measurements > 1 NTU:

Date	Turbidity, NTU	Date Reported to VDH

INDIVIDUAL FILTER MONITORING
FILTER PERFORMANCE MONTHLY OPERATION REPORT

Waterworks: _____ MONTH: _____

PWSID No.: _____ YEAR: _____

COUNTY: _____

Was individual filter turbidity monitoring conducted during the month? _____ (yes or no)

Were all continuous turbidity monitors in operation for the entire month? ___(yes or no)

If no, list the filter number and the dates the continuous turbidity monitor was taken out of service, dates returned to service and if grab samples were collected every four hours while the continuous turbidity monitors were out of service.

Filter Number	Date taken out of service	Date returned to service	Grab samples collected as required (yes or no)

Did any of the following exceedances occur? _____(yes or no) If yes, complete the chart.

Exceedance #1. Turbidity level greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart?

Filter Number	Turbidity Measurement	Date(s) of Exceedance
Date Filter Profile was produced:		
Reason for the Exceedance:		

Exceedance #2. Turbidity level greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation, after the filter has been backwashed or otherwise taken offline?

Filter Number	Turbidity Measurement	Date(s) of Exceedance
Date Filter Profile was produced:		
Reason for the Exceedance:		

Exceedance #3. Turbidity level greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of three consecutive months?

Filter Number	Turbidity Measurement	Date(s) of Exceedance
Date Self-assessment was produced:		

Exceedance #4. Turbidity level greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months?

Filter Number	Turbidity Measurement	Date(s) of Exceedance
Date comprehensive performance evaluation will be performed:		